

VDTs - A NEW SOCIAL DISEASE?

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Submitted by Herb Spierer
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For millions of people, work will never be the same again. Jobs that used to require filing, scribbling, telephoning, talking, typing, or flipping through books and ledgers now require workers to punch the keys of a computer terminal, read the words displayed on its screen, and punch the keys some more. There is no question that video display terminals (VDTs) make many tasks easier, but they do not necessarily make a job easier, more pleasant, or healthier.

The health problems that have so far been associated with VDTs fall into four broad categories: alleged radiation hazard, visual disturbances, musculoskeletal difficulties, and job stress. This last category, though it sounds vague, may have the most significant long-term effects on both the emotional and the physical health of VDT users. Most of our information in this essay comes through a leading authority on VDTs and health, Dr. Michael J. Smith of the National Institute of Occupational Safety and Health (NIOSH). The same principles can be applied to the use of home VDTs as well.

RADIATION: Alarm about the potential radiation hazard from VDTs was triggered when two editors for The New York Times appeared to develop cataracts within a year after the newspaper shifted them to working with terminals. Subsequently, a few other cases of cataract also have been attributed to VDTs. More recently, some pregnant women working with VDTs have reported miscarriages or abnormal offspring. Both the cataracts and the reproductive problems have, understandably, been attributed to radiation leaking from the terminals.

However, repeated measurements of radiation from VDTs have shown that leakage is well below present standards for occupational exposure. And certain types of radiation, such as x-rays or radio frequencies, have not even been detectable. In the meantime, new cases of cataract have not been reported at the rate one would expect if VDTs were causing them. The question of reproductive difficulties is still unsettled. The Ministry of Labor in Canada has recommended that pregnant women be allowed to shift from operating VDTs to other kinds of work for the duration of pregnancy, but its task force has not cited any evidence, other than existing anecdotes, in support of their recommendation. In the U.S., NIOSH is preparing a large study of pregnant women who work with VDTs, but the results will not be available for about two years. It is well to remember that the rate of miscarriages (about 15% of all pregnancies) and birth defects (almost 2% of births) are sufficiently common that the clustering of reported problems is quite likely to be the result of a statistical accident, not VDT exposure.

On the basis of existing evidence, there appears to be no radiation hazard from VDTs (but see The HMS Health Letter of January 1983 on the use of old TV sets in homemade VDTs).

VISUAL DIFFICULTIES: People working with VDTs report discomfort or difficulty with their eyes more often than other workers with visually demanding jobs. More than half of VDT operators have eye complaints, mainly, irritation (the eye appears red, is teary, or feels gritty), fatigue (eyes are tired or ache, there may be headache, and the eyelids feel heavy), or difficulty with focus or accommodation (blurriness, difficulty seeing near or far objects). Fatigue is the most common complaint, and the one most likely to persist from the end of one day to the beginning of the next. Difficulty with focus usually ends within half an hour of resting the eyes.

In themselves, most VDT screens seem to meet basic requirements for visual work, although poor maintenance, can allow defects to develop. Here are some current minimal criteria for the visual display:

- (1) the image should not flicker;
- (2) the entire display should be in sharp focus (no blurred edges);
- (3) the contrast between light and dark areas should be at least 8 to 1;
- (4) the characters should be formed in a 5 x 7 matrix of dots at the very least;
- (5) all VDTs should have brightness and contrast controls that the operator can find and adjust.

Dark characters on a lighter background may be somewhat easier to read than a negative image.

When VDTs create visual difficulties for operators, it is usually because they are located in improperly designed work areas. Too often, they are simply plunked down in an office that has been illuminated for work with "hard copy" (what we used to call "paper"). In this setting, light levels are usually too high for VDT work, so the operator must strain to see the relatively dim screen in a bright environment. Also, sunlight or poorly placed lighting produces glare on the screen, which makes the eye muscles work overtime to compensate for the distracting area of brightness.

Thoughtful design of lighting is crucial for the VDT operator to work comfortably and productively. If the operator must look mostly at the screen, room lighting should be quite low. On the other hand, if the operator is mostly reading from a paper and entering material into the computer, room illumination probably needs to be relatively bright. Someone whose eyes must travel back and forth between screen and paper probably needs low general illumination with a somewhat brighter light directed onto the paper.

Glare on the screen is often more of a problem for operators than inappropriate brightness of room lights. Simply blocking windows and dimming the lights is not a good solution; the resulting atmosphere can be too reminiscent of a mortuary or dungeon - not good for either morale or productivity. Filters placed over the screen can eliminate glare, but they also diminish both contrast and brightness of the display. Hoods fitted over the terminal can be used to block sources of glare, but they make it hard for the operator to look back and forth from screen to documents. If a VDT cannot be located in a glare-free position, it may be necessary to redesign the lighting of a room.

MUSCULOSKELETAL DIFFICULTIES: The virtue of a VDT is also, from the body's point of view, its main defect. Because VDTs eliminate the need to move around (for files, a new piece of paper, an eraser), they also eliminate the opportunity to squirm, wiggle, and adjust that goes with such activities. Unfortunately, sitting stock still is bad for people (contrary to what our Victorian grandparents believed). A long period of sitting puts a strain on the back and neck, slows circulation in the legs, and generally reduces muscle tone. To compensate for the exceedingly static nature of VDT work, frequent breaks are advisable, and they should include more movement than that required to transport a coffee cup from desk to lip.

VDT keyboards have exceedingly fast action; it is impossible to "out-type" them. Repeated rapid striking of the fingers on a surface, if it goes on for hours, may lead to inflammation of structures in the hand and wrist. In some cases, a worker may experience the "carpal tunnel syndrome" of pain, weakness, and tingling, usually involving the thumb and first two fingers.

Shoulder, neck and back complaints are common in VDT operators. Sheer immobility, which weakens the postural muscles, probably contributes to these symptoms, but bad design of the work station is also a major factor.

VDTs should be equipped with keyboard that can be detached from the screen. The keyboard needs to be relatively low, so that the arms and hands can be held at a comfortable angle. The screen should be high enough to be easily seen without excessive flexing of the neck (that is, the viewing angle should be less than 25 degrees). A screen and keyboard can be jury-rigged into the correct arrangement with the aid of a saw, a pile of old books, or other standbys. But in the long run, a better approach may be to purchase adjustable furniture for the work station.

An expensive chair is too often regarded as a mark of job status, rather than as an essential work tool. VDT operators, like other keyboard operators, should be equipped with chairs that are comfortably padded, fully adjustable, and designed to provide firm support to the lower back. The work station should be designed to fit the operator's job. Ideally, the operator should participate in planning it.

JOB STRESS: Most VDT workers find that their jobs have enjoyable features, but over 75% of them also have physical or stress-related complaints attributable to the use of the terminal. The frequency of complaints about VDT use is higher than in any other work situation. VDTs themselves do not seem to be responsible. Rather, stress-related complaints are based on lack of planning.

Among the more common planning problems are the following:

- (1) VDTs are often introduced to their users without adequate training. When employees are using the equipment inefficiently they become frustrated.
- (2) Too often, workload requirements tend to be set more by the capacity of the machine than that of its human operators. (This is not a new problem, as viewers of Charlie Chaplin's movie *Modern Times* may recall.) The fact that a computer can now process millions of bits of information in a minute does not mean that human capabilities have increased proportionately.
- (3) The computer may be used to give a supervisor too much information about an operator's output. Constant monitoring and inflexible requirements for productivity can be exceedingly demoralizing. Everybody's ability to work varies in the course of the day and week.
- (4) When a computer is introduced, many jobs are reduced in scope and become more monotonous. The VDT operator may be more isolated from colleagues. When the quality of a job is degraded in this fashion, both the worker and the employer suffer.

IN SUMMARY: The VDT is not just another piece of equipment; it changes the nature of the work people do. Most potential health problems caused by VDTs can probably be averted by planning that takes account of the operators' needs. Lighting and furniture at the worksite may need to be rearranged or redesigned to

prevent eyestrain and postural stresses. Operators need to have frequent breaks, to be able to move about, to work at a variable pace and to meet requirements set by human capacity, not a computer's. There are many opportunities to avoid becoming a "terminal case".

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FINANCIALLY PLAGUED VECTOR GRAPHIC TERMINATES 100 OF 150 WORKERS

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by Keith Newman, reprinted from Computer Retail News, 11/5/84

Vector Graphic Inc. has cut its work force by two-thirds, laying off more than 100 of its 150 employees, as part of an on-going effort to trim costs while actively seeking a merger or acquisition partner. The Manufacturer's second round of across-the-board layoffs, which followed a 20 percent work-force cut in June, was initiated by its board of directors as part of the company's plan to break even until outside financial help is received, according to chairman Jean Deleage.

Deleage, a Vector director since 1979 and a vice president of the major venture-capital firm of Burr, Egan, Deleage and Co., said negotiations currently are being conducted with several prospective candidates interested in acquiring the company. However, he declined to reveal the names of any parties involved in negotiations and would only add that Vector is engaged in talks with at least four firms. Commenting on the talks, a Vector spokesman said: "If we can pull out of this and get together with another company, I think we will make it."

Last June, company president Bernard Horn, who replaced company co-founder Lore Harp as president in March, outlined a three-part program aimed at returning Vector to profitability by the end of the calendar year. The first part of that program was to have been the implementation of several cost-cutting measures, which included the company selling its 120,000-square-foot corporate and manufacturing headquarters and moving into a smaller facility. That move was immediately to be followed by part two of the plan, the layoffs. Part three would be a new, highly developed series of vertical-market computers and accessories products.

As of the current time, only the layoffs have been implemented. The new products, rumored to be IBM-compatible, have not been unveiled, and the company still remains in its large facility. However, the Vector spokesman added that the company's advances in vertical markets, particularly in the agricultural market, have brought it a growing band of dedicated dealers, which number approximately 400. He said the company was planning to introduce a new computer, the SX-8000, at the upcoming Comdex trade show, but that it backed out of the show because of its financial troubles. Still, the spokesman said, the computer is "dynamite" and will likely be introduced within the next month, with shipments soon to follow.

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BASIC/Z CORNER #22

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by Steven Guralnick
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Because this last month's mail has not brought me code, this column is going to be a little more philosophical than usual.

Let me start by saying that in response to a mailing I did to a number of Basic/z users, I received some very nice letters, all of which seemed to indicate that the column was helpful and on the right track. I appreciate that, but I think you would all agree what is needed in each of the columns is a good routine: some source code that does a good job in an efficient way. For the last 21 columns I have attempted to publish such routines. Many of them have been from programs which I have written and where I know they work.

The problem is that I don't program as a hobby; rather, I program as I have a need. I purchased the first computer for this office in 1979. We badly need computerized word processing capability and the Exidy Sorcerer had the Word-Pak. The Word-Pak was one of the early versions of what later came to be known as SPELLBINDER. Those of you out there who ever used it know how powerful it was.

About a year later, when we were well into the word processing routine, I started writing simple programs that performed various tasks for the office. Keep in mind that in those days, software (and software support) was practically nonexistent. Worse, it was obvious early on that not too much software was going to be written for the Exidy.

For the next two years, I developed my software skills, using Micropolis Basic for a lot of it. When we had to switch to CP/m completely, Buzz steered me to Basic/z. I spent months converting Micropolis software and CBasic software. When that job was complete, I wrote several more programs for the office, the last of which was just completed a few weeks ago.

In running my mind's eye over the situation, I now notice that the office is as automated as it really can be. In fact, in order to write any more programs, I would have to have hard disk and I would be spending several months of my life doing it. My office closes somewhere between 5:00 and 6:00 p.m. and I do not program after hours or on weekends. I have other pursuits at those times and since we have two computer systems in the office, I can sandwich in programming during the working day and not be in the way of the secretary.

What I am getting to is this: In order for me to print code in columns, I'm either going to have to go back over old programs or I'm going to have to make it up as I go along. If Jerry Lenz is reading this, I want to make the point that he has furnished a number of fine programs, including a couple recently. However, I do not find it very enjoyable to have to call Jerry to help make a column. There are a lot of you out there programming in Basic. As I mentioned some time ago, I can probably work with a Micropolis Basic or a CBasic program. If you have Micropolis disks, Buzz has offered to transfer the code to eight inch. If you have eight inch disks, I can read them directly.

This column started out to be a switchboard for Basic/z users. The idea was to furnish a pot in which routines could be cooked and disseminated. What it has actually evolved into is that I have the pot and I have the stove and I also have to put in all the ingredients and that's not fair to me or you.

The bottom line is this: I enjoy doing the column and I would like to keep it going forever. This column is at a critical point. I will be on vacation in December so there will be no column in January. Whether there is going to be a column in February depends on whether I hear from enough of you, with some programs, to make it worth continuing. The choice is strictly up to you.

I want to wish you all the very best of the Holiday Season and much happiness in the coming New Year.

(ED Note: I elected, probably incorrectly, to run Steve's December article in January. I hope I haven't messed up the system. If you've got something to say to Steve in response, please do so.)

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(End - Basic/z SIG)

S-100 WITHDRAWALS

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It's not been a good month for us S-100 fans. The S-100 Microsystems and the Microcomputing magazines both stopped publication. The PROTEUS News/Processor Technology SOL Users Group and the Sorcerer's Apprentice/Exidy Users Group both disbanded their organizations. Computer Mart of NJ (Prodigy) can't sell me their version of Micropolis CP/M anymore, because Digital Research won't sell Computer Mart the CP/M manuals small units of purchase. If I wanted to order a hundred, I could get them. We can still get Lifeboat's version, but it's more expensive. Lifeboat really seems like a difficult firm to deal with, too. We've received the wrong product, the right product but billed at retail instead of dealer cost, and no product (but it was billed at the correct dealer cost). We can't seem to ever get the billing of our account straightened out. And the error obviously isn't in my favor, else I'd be chuckling instead of complaining.

At any rate, if you MUGgles know of any remaining S-100 or CP/M based publications, please drop me a note. Personally, I'll really miss Microsystems. I can't understand why it folded. Gosh, there are magazines on antique cars. Why not one for us?

I have received information on one magazine called Micro Cornucopia (P.O. Box 223, Bend OR 97709 - \$16/yr bulk rate, \$22/yr first class, \$22/yr Canada & Mexico, \$30/yr elsewhere). It is a bi-monthly semi-slick publication of some 80 pages. It supposedly is going to expand its outlook to cover the S-100 systems. Sol Libes, who started S-100 Microsystems, is said to be beginning regular columns in the Feb-March issue.

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LETTERS
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BASIC/Z ON MDOS

Buzz: Received my MDOS version of BASIC/Z. It's a great value and just the experience of working with it has made the investment worthwhile.

I have two problems that perhaps you or one of the members might be able to answer for me.

The first is the direct cursor control feature. My computer system was manufactured by Computer Data Systems (now defunct) and my video card is a Dynabyte Naked Terminal. In a MDOS program I can direct the cursor with PRINT CHAR\$(27);"C";N1;"",N2;CHAR\$(13);. I would like to use the BASIC/Z TAB feature but don't know the proper control codes or offsets. (N1 and N2 above are the line and column numbers)

The second problem is a RECLen error on translated data files. It is my understanding that the translator yields a random file with a RECLen of 250. However, when I attempt an OPEN 1 "file-name" RECLen 250, I get a reclen error. The file consists of records 250 bytes in length from which I parse the data.

David Montgomery, Jr., Box 1000, Mt. Pocono PS 18344 - (717) 839-7707

TERMINAL INSTALLATION

Dave - It wasn't clear, in regards to your first question, whether you knew you had to run the INSTALL program and didn't have the necessary data, or whether you didn't know about INSTALL. In either case I'll try for an answer. As with all software, you should make a copy of the original disk. Do all your work on the copy. Then type -

RUN/Z "INSTALL"

---In all cases, I'm putting my comments in with the "---" on the front. Your answers to INSTALL's question are in the square brackets.

---The system responds with the following:

RUN/Z (MDOS) - Rev. #1.00 - Serial #xxxxx
Copyright (c) 1982 by System/z, Inc.

Install Run/z (MDOS) - Rev. #1.00 - Serial #xxxxx

Enter drive name of RUN/Z location (0-3) -[0]

It may be necessary to enter certain control codes as an ASCII value. Although the default entry mode is base 10 (decimal), would you prefer to enter them in base 16 (hexadecimal) ? [N]

Supported terminals:

Ampex D-30, D-80, D-81
Compal 8100, 8200
Hazeltine Esprit, 1400, 1410, 1420, 1500, 1510, 1520
Lear Siegler ADM-3A, ADM-3A+, ADM-5, ADM-21, ADM-31, ADM-32, ADM-42
Processor Tech Sol
Soroq IQ-120
Televideo 910, 912, 920, 925, 950
Vector Graphic MT
none of the above

---The above terminals are presented in a set of menus. The "none of the above" option has a "0" selection code.

Your selection - [0]

This will require non-standard configuration. Do you wish to continue? [Y]

---The March 81 newsletter has some information on the Dynabyte terminal, but not enough to answer all the question. Since a lot of us have "weird" terminals, perhaps we should reinstate the documentation of these devices.

Terminal lines per page ? [24]
 Terminal columns per line ? [80]
 Terminal support a clear-screen command ? [Y]
 For clear-screen -- How many control codes (1-8) ? [1]
 Control code 1 ? [12]
 Terminal support cursor addressing ? [Y]
 Is the line number to be sent first, followed by the column number (Yes in most cases) ? [Y]
 Offset to be added to the line number ? [0]
 Offset to be added to the column number ? [0]
 For cursor addressing lead-in -- How many control codes (1-8) ? [2]
 Control code 1 ? [27]
 Control code 2 ? [67]
 Between the line and column, how many control codes (0-4, but usually 0) ? [1]
 Control code 1 ? [44]
 ---The 67 and 44 are the decimal equivalents of the "C" and ",," mentioned in your letter.
 After the line and column, how many control codes (0-4, but usually 0) ? [1]
 Control code 1 ? [13]

---I don't know if the Dynabyte supports any of the rest of the BASIC/Z capabilities. You'd answer "N" if it doesn't, but I've shown what happens if the answer is "Y". Of course you need the right data for the answers.

Terminal support erase end-of-line? [Y]
 For erase end-of-line -- How many control codes (1-4) ? [1]
 Control code 1 ? [0]
 Terminal support erase end-of-screen ? [Y]
 For erase end-of-screen -- How many control codes (1-4) ? [1]
 Control code 1 ? [0]
 Terminal support reverse video ? [Y]
 To enable reverse video -- How many control codes (1-4) ? [1]
 Control code 1? [0]
 To disable reverse video -- How many control codes (1-4) ? [1]
 Control code 1? [0]
 Terminal support blinking video ? [Y]
 To enable blinking video -- How many control codes (1-4) ? [1]
 Control code 1? [0]
 To disable blinking video -- How many control codes (1-4) ? [1]
 Control code 1? [0]
 Code for cursor left ? [8]
 Code for cursor right ? [32]
 Will your terminal automatically generate a carriage-return/line-feed upon writing to the last column (on some terminals, this is a switch-selectable option) ? [Y]
 It may be necessary to insert a slight delay immediately after RUN/Z clears the terminal screen or positions the cursor, or some characters to be printed may be lost.
 How many milliseconds delay should be inserted after a clear screen (0-255, but typically 25) ? [25]
 How many milliseconds delay should be inserted after cursor positioning (0-255, but typically 10) ? [10]
 Will your printer recognize a "form-feed" code (0C HEX) to move to top-of-form? [Y]
 Printer - maximum columns per line ? [132]
 Printer - minimum column to suppress generation of a "wrapping" carriage-return/line-feed by RUN/Z (usually the same as max columns above) ? [132]
 Optionally, you may choose to set a permanent memory end for RUN/Z. Do you wish to do so - (Y or N, but usually N) ? [Y]
 Enter permanent memory end (Hex) ? [FFFF]

For certain input and edit function, RUN/Z allows each of the applicable control keys to be user-defined.

Current definitions:

Cursor line start:	Cntrl-W
Cursor left character:	Cntrl-S
Cursor right character:	Cntrl-D
Cursor line end:	Cntrl-E
Delete char left:	Cntrl-H
Delete char left (alt1):	Cntrl-Z
Delete char left (alt2):	RUB
Delete entire line:	Cntrl-X
Delete char right:	Cntrl-C
Insert mode toggle:	Cntrl-V

Any changes desired ? [Y]

For each of the functions, enter the actual desired control code (not the numeric representation of it).

---This is pretty neat. You just push the keys you want to use for the editing function, e.g., push your left arrow cursor control key for "cursor char left".

Cursor line start: [push the keys]
etc.

Any changes desired ? [N]
All ok to configure 0:RUN/Z ? [N]

That's the end of the installation. For you casual readers, remember that this is only the MDOS version of BASIC/Z. The CP/M version has further enhancements, but installs the same way. One item of interest, in either case, is the question about "optional permanent memory end". For those of you with Exidys, or any other system that uses the last few bytes of contiguous memory for the system, you'll need your dealer to pre-install a version of RUN/Z that has an end of memory. Otherwise, running RUN/Z "INSTALL" causes RUN/Z to try and use all memory, which hangs the system. If you're buying from DAMAN, be sure and tell us of such a system, or return it to us for pre-installation if INSTALL hangs.

FILE TRANSLATION

In regard to question 2, you're correct. Running TR/I produces a random file of record length 250. I can only guess that something went wrong in the process that didn't allow complete translation, or that you gave an incorrect file name in your subsequent calling program. I tried the process and it works fine for me. The procedure works like this:

RUN/Z "TR/I"

Translator I (MDOS) - Rev. #1.00 - Serial #xxxxx
Copyright (c) 1982 by System/z, Inc.

MDOS source file name: 0:FILE.MPB..

BASIC/Z destination file name: 0:FILE.TRI..

Prepare drive(s) - type Y when ready - [Y]

Translation completed successfully.

MICROPOLIS MDOS VS 4.0 - COPYRIGHT 1978

For your information, there is a second way to produce a BASIC/Z random file from a Micropolis data file. The TR/I method produces a 250-byte record in a 256-byte physical sector size. Application programs which access, let's say record 2, must physically access sectors 1 and 2 to get the data. It might be better to generate your new files by way of your own application program, and make the record length 256 instead of 250.

Most of my Micropolis Basic data is "packed" two logical records per physical record. To rid myself of the code which packs and unpacks such a data structure, I want random records of size 125. But since BASIC/Z gives you 6 more bytes per physical sector, I translate the record to be 128 bytes in length, or $2 \times 128 = 256$ bytes per sector. I do this just by putting 3 blank spaces on the end of each logical record during translation. The theory is explained in Section 6.003 of the manual. My translation program looks like this:

```
10 DIM REC$(259),ALL$DATA$(250):FORMFEED:PRINT "Mount Disk with File to be Converted in Drive 0."
20 PRINT:INPUT "Press RETURN to Continue-- ";R$:DISPLAY "0:"
30 PRINT:INPUT "Enter File Name to be Converted-- ";FILENAME$
40 OPEN 1 FILENAME$ UNFMT RECLEN 260:CREATE 2 "0:"+FILENAME$ RECLEN 128
50 FOR I#=1 TO SIZE(1):GETVEC 1 REC$(0),REC$(259)
60 ALL$DATA$=STRING$(REC$(4),REC$(253))
70 PUT 2 LEFT$(ALL$DATA$,125)+"   ":PUT 2 RIGHT$(ALL$DATA$,125)+"   "
80 NEXT I#:CLOSE 1:CLOSE 2
90 PRINT "Mount MDOS Disk in Drive 0.":PRINT:INPUT "Press RETURN to Continue-- ";R$:END
```

This program accesses the Micropolis Basic file directly. The "UNFMT RECLEN 260" used in line 40 is the standard method. Using UNFMT allows you to read any Micropolis file, not just the Basic data file. The program also uses the "vector read" capability of BASIC/Z. Line 50 reads the 260 bytes of the Basic record into an integer array named "REC\$". Since the first four, and the last six, bytes are only of interest to Micropolis Basic, we need to throw them away. Line 60 converts the usable data, presently in

integer format, back into a 250-byte string format. I then put the data out into my new file, splitting the data into the two logical parts, and appending the 3 blanks. You might do the same sort of thing, but use a 6-blank pad. Then do a one-for-one write for each read, instead of my two-for-one.

Line 70, for you, would read:
70 PUT 2 ALL.DAT\$+" "

To print the data created from the above program, use this routine:

```
10 DIM W$(128):FORMFEED:PRINT "Mount Disk with File to be Printed in Drive 0."
20 PRINT:INPUT "Press RETURN to Continue-- ";R$:DISPLAY "0:*"
30 PRINT:INPUT "Enter File Name to be Printed-- ";F$:OPEN 1 "0:"+F$ RECLen 128
40 FOR I#=1 TO SIZE(1):GET 1 W$
50 PRINT LEFT$(W$,30):! Name
60 PRINT MID$(W$,31,22):! Address
70 PRINT MID$(W$,99,19)+""+MID$(W$,72,5):! City, State, Zip
80 NEXT I#:CLOSE 1
90 PRINT "Mount MDOS Disk in Drive 0.":PRINT:INPUT "Press RETURN to Continue-- ";R$:END
```

Obviously, your data contents would be of different substance, and in different locations, than mine. But you should get the idea. You'd have to dimension W\$ to 250 and have a RECLen of 256.

Using the TR/I translation results would change the above routine only in setting the dimension of W\$ to 250 and RECLen to 250.

If you wished to access a file on drive 1, in either the translation or the print routines, just change the "0:" to "1:". Actually, you can use "A:" and "B:", if you wish. In the above program, the print will go to the console. Insert a LPRINTER command for printer output, and any additional PRINTs to space the printout correctly.

Micropolis Basic users may wonder what the "I#" variable is, and what DISPLAY "0:*" does. I could have used "I" for a real variable, or "I%" as an integer. They would both take more memory than "I#". BASIC/Z also has single-byte integers (0 to 255) which are designated as, in this case, "I%", and two-byte integers (0 to 65535) which are designated as "I#". Since the number of records in any file that I might be translating may exceed 255, I used the two-byte variable. "I", of course, is just the variable name I used. Variables can have names of any length, with all characters significant, composed of letters, digits, and the period, as long as the first character is a letter.

The "*" in "0:*" is a mask which designates what files to display. "*" means all files. One can also use a question mark to match any character. If I'd written DISPLAY "0:FILE?????", the program would display only those files beginning with "FILE", which would include FILE.MPB and FILE.TRI of the above program.

VECTOR GRAPHIC/S-100 EXPANSION

Buzz: As you know, I am a Charter Subscriber to the newsletter, going back to the days when it was only \$12 a year. I've always found it very valuable and useful in operating my old Vector Graphic 48K MZ. I upgraded it with CP/M, still at 48K, and it has given me many years of faithful service. But the time is coming when I, and I think many other of your readers, must make the leap into the world of MSDOS. Of the many ways to do this, the one I would like to explore with you is the possibility of using my MZ and its many empty slots.

Do you think it would be cost effective to buy one of those new S-100 boards with the new chips, more memory, battery clock calendar, etc., etc.?

What would be involved with getting one of the new boards and programming it so that I could have both my old system and new one in the same box?

It seems to me that if a hundred of us S-100 types got together, we should be able to upgrade our system, including one of those nice hard disk drives, to MSDOS and 512K for less than \$3,000. Now I know Kay-Pros and even IBM are close to that figure, but many of us are comfortable with what we have and only need another hard disk drive or two and more memory to be able to keep our system forever.

I think this problem is so widespread among your readers that an editorial response might be very useful for us all.

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Peter: Widespread? You bet. Me too. I'm worse than any kid I've ever known. I want that - and that, and boy could I use one of THOSE. I've just got to have THIS - everyone I know has one.

Please, any reader who has comment or information pertinent to this subject, or to my response below, drop me a line.

Do I think it would be cost effective? No way. Would it be fun? Probably too many headaches, but the answer to that depends on how much of a masochist one is. Would it be educational? Oh, boy would you get an education. Would you eventually get to where you desire? NO!! Can one enhance the Vector MZ and get an improved machine? Surely can.

Burks hit the nail on the head in his Intro article three months ago. I'm always a little slow keeping up with the Joneses. Back when the MUG was \$12, I was continually putting CP/M down. You didn't need anything but MDOS. Burks was sending in articles saying that the world was changing to CP/M, but I wasn't buying it. What do I run now? Mostly CP/M. Why? Because the application programs and hard disk are more available with CP/M. Lynn doesn't share my approach. She still uses Micropolis Basic programs on MDOS. She wants the ability to create larger files and wants me to get OSM working on the Micropolis Rigid Disk. (OSM is a MDOS look-alike, except it is multi-user on the 32 mega-byte hard disk.) She doesn't do any word-processing, doesn't do spreadsheets, and doesn't do database management. (She also doesn't like to talk about it, but she uses a CP/M Basic/z implementation for invoicing, and a CP/M Basic/z translation of the MDOS version of Burks Smith's Bookkeeping for the accounting.)

You didn't really state what your problem was with your system, outside of wanting more memory and a hard disk. So, I'll approach this hypothetically. What one NEEDS to do is get one's job done, in, as you say, a cost effective manner. Is yours getting the job done? Would a new computer pay for itself if increased processing speed? Is there a problem with maintenance?

The Vector 3005 was probably the best computer Vector Graphic ever made. It was fast (6MH Z80H), compact (all the electronics was in the video terminal), and it had a 5MB hard drive. You could even get it with 128K Extended CP/M, essentially CP/M 3.0, which increased the disk access speed and opened up the user (TPA) memory.

This machine seems to solve most of your problems, though I don't know the specifics of your "more memory" requirement. Why would anyone (are you listening, Burks?) want anything more than this machine?

We're probably all a little spoiled. The computer aboard the Space Telescope only has 32K of memory. When I first started professionally programming on a DEC PDP-11 mini-(not micro) computer used for the ground support of orbiting spacecraft, I only had a 2K block of memory that I could use at a time. So why do we now NEED 20 Mb hard disks and 256K of RAM? Partially, because its there. I think there are really two lines of thought here. One is a real need; the second being a desire. I can certainly make a good argument for not needing a 20Mb disk and color graphics if all you're doing is word processing.

Anyway, what sorts of things can a Micropolis/Vector Graphic owner do to enhance his system? I think you have five options.

Option 1: Available only to people running Micropolis single-sided drives, which includes you, Peter. Add a Micropolis IDA board, a Micropolis 10, 20 or 30Mb Rigid Drive, and a CP/M patch program. Option 1's pluses include dependability - I've been running for 4 years with zero problems; Speed - 7.5 Mb/s transfer rate, versus 5.0 Mb for Seagate 5 1/4 drives, and 0.25 Mb/s for floppies; Convenience - Absolutely no change in disk format, and your floppies stay on-line in the system. You can run with or without the Rigid Disk in the system.

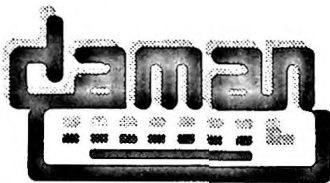
Minuses: Somewhat expensive, non-local maintenance, and a loss of 6K of TPA.

Option 2 - Available only to people running Vector Graphic. Switch to the dual controller board. Might have to change the CPU board. Change PROMS. Change CP/M versions. Add 5 Mb Seagate Hard Drive. Perhaps Woody will cost this out for us. I know he'll perform this modification for you. Pluses: Dependable - Been running for 2 years with zero problems; Fast - 5.0 Mb/s transfer rate; Convenience - no change in disk format. Minuses: Somewhat expensive.

Option 3 - Available to anyone. Buy a Vector 4H. Pluses: Has dual processor (Z80 and 8088). Runs CP/M 80, CP/M 86, and MSDOS. Has color graphics option. Convenient - no change in disk format. Minuses: The 4H is said to be a bit slow, compared to the 3005. What's the future support probability?

Option 4 - Available to anyone. Add boards. We'll have to expand on this one in a later article.

Option 5 - Available to anyone. Buy a completely new system and convert your disk to the new format. This isn't as bad as it sounds. Lots of people are doing it. You can run both systems, doing some tasks on one, others on the second. Assuming you select intelligently, you should have no problems with maintenance on the new machine. Something like the DEC Rainbow, which also has a dual processor,



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allowing you to run your CP/M 80 programs while you get your 16-bit MSDOS system figured out. DEC gives big company support, even if you have no local dealer. By using communications programs on each computer, and a hard wire connecting them together, any or all of your current software can be transferred to the new machine. The Vector 4S is the same type of machine. Vector, unfortunately, isn't the same type of company.

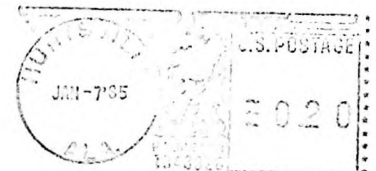
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QUME SPRINT 5 PRINTER

Buzz: I would like to have a program that would allow me to use my Qume Sprint 5 to print files bidirectionally. I discovered that in order to write such a program, I would need the programmer's manual for the printer. Does anyone have this manual or a program that will do what I want?

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